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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/803,391	03/09/2001	Keiichi Mori	OOCL-51 (2SK-01S0135)	8703

26479 7590 11/17/2005

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EXAMINER	
YODER III, CHRISS S	

ART UNIT	PAPER NUMBER
2612	

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/803,391	MORI ET AL.	
	Examiner	Art Unit	
	Chriss S. Yoder, III	2612	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 August 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,11,12 and 30-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,11,12 and 30-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date: _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The amendment filed August 8, 2005 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

Claim 1, lines 15-16, recites the limitation, "charges of said solid-state imaging element are read separately, one at a time". Wherein the specification states on page 11, lines 20-25, that "a vertical driving pulse ϕV in each horizontal blanking interval (H-BLK), thereby inputting a line of charges from the vertical transfer path to the horizontal transfer path (**more specifically, inputting one pixel from each vertical transfer path**)."

Applicant is required to cancel the new matter in the reply to this Office Action.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

Response to Arguments

Applicant's arguments filed August 8, 2005 have been fully considered but they are not persuasive.

Applicant argues, with respect to claims 1 and 4, that Suzuki does not teach reading out charges of individual pixels separately, one at a time.

However, the examiner would like to point out that this newly added limitation of the individual pixels being read out separately, one at a time is considered to be new matter as stated above.

Applicant argues, with respect to claim 4, that Suzuki does not teach the use of three driving modes. However, the examiner points out that the use of three driving modes is not claimed; there are only two driving modes present in the claim (normal and n-addition mode). Applicant also argues that claim 4 states the use of at least two different values of n. However, this claim does not state anything other than the use of a number "n" for n-addition mode.

Applicant argues, with respect to claim 11, that Kijima does not disclose the detail of controlling Vsub potential according to the number (n) to be added in n-pixels-addition. However, the examiner points out that in two separate examples in Kijima the Vsub potential is adjusted according to the number (n) to be added; (1) found in column 8, lines 55-60, the Vsub potential is adjusted so that the wells are one-half of the capacity when two pixels are read and (2) found in column 11, lines 57-67, the Vsub potential is adjusted so that the wells are one-third of the capacity when three pixels are read.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-6, 30-33, and 35-36 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki et al. (US Patent # 5,786,852).

2. In regard to claim 1, note Suzuki discloses the use of an image pickup device comprising a solid-state imaging element (figure 1: 1), a driving means for driving said solid-state imaging element (figure 1: 4), an overflow level setting means for controlling a substrate bias voltage of said solid-state imaging element in order to variably set an overflow level of a charge accumulating portion of the solid-state imaging element, the overflow level being determined according to the substrate bias voltage (column 9, lines 49-52 and column 9, line 61-column10, line 7; the overflow level is set based on the change in Vsub), and a reading control means capable of reading pixel charges as an output signal by means of said driving means in a normal driving mode in which individual pixel charges of said solid-state imaging element are read separately, one at a time (the limitation of one at a time is interpreted to mean one pixel from each vertical transfer path, as taken from applicant's specification on page 11, lines 20-25), or in an n-addition driving mode in which a specific number "n" of pixel charges in the vertical direction of said solid-state imaging element are added and then read (column 9, lines 49-52 and column 9, line 61-column10, line 7; the field mode reads out pixels that have been added, and the frame mode reads out every pixel, this can be seen in column 1, lines 32-40; the frame mode is used on an interline sensor where every line is read out separately as seen in column 11, lines 18-37), wherein said overflow level setting means controls said substrate bias voltage to a different value, depending on whether the reading control

means reads the pixel charges in said normal driving mode or in said n-addition driving mode (column 9, lines 49-52).

3. In regard to claim 2, note Suzuki discloses the use of said overflow level setting means controls said substrate bias voltage based on a relationship between the overflow level of the charge accumulating portion and a saturated level of a horizontal transfer path included in said solid-state imaging element (column 13, line 54 – column 14, line 10; the overflow level is set using the saturation capacity of the photoelectric conversion cells as well as the saturation value of the horizontal transfer part).

4. In regard to claim 3, note Suzuki discloses the use of further comprising said substrate bias voltage in said n-addition driving mode created based on a measured value of the relationship between the overflow level of said charge accumulating portion of said solid-state imaging element and the substrate bias voltage is stored beforehand (column 9, line 61- column 10, line 7; Vsub is created based on the relationship between the overflow level of the charge accumulating portion and the substrate bias voltage; as for the storage of the values, this is not explicitly stated, however, it is inherent, because if the values were not stored, the imaging device would not know what level to adjust the level to), and wherein said overflow level setting means controls said substrate bias voltage in said n-addition driving mode based on the adjustment information in said storage means (column 9, lines 49-52 and column 9, line 61-column10, line 7).

5. In regard to claim 4, note Suzuki discloses the use of an image pickup device comprising a solid-state imaging element (figure 1: 1), a driving means for driving said solid-state imaging element (figure 1: 4), an overflow level setting means for controlling a substrate bias voltage of said solid-state imaging element in order to variably set an overflow level of a charge accumulating portion of the solid-state imaging element, the overflow level being determined according to the substrate bias voltage (column 9, lines 49-52 and column 9, line 61-column10, line 7; the overflow level is set based on the change in Vsub), reading control means capable of reading pixel charges as an output signal by means of said driving means in a selected one of (A) an n-addition driving mode in which a specific number "n" of pixel charges in vertical direction of said solid-state imaging element are added and then read (column 9, lines 49-52 and column 9, line 61-column10, line 7; the field mode reads out pixels that have been added, and the frame mode reads out every pixel, this can be seen in column 1, lines 32-40), and (B) a non-addition driving mode in which individual pixel charges of the imaging device are read separately, one at a time (the frame mode reads out every pixel, this can be seen in column 1, lines 32-40; the frame mode is used on an interline sensor where every line is read out separately as seen in column 11, lines 18-37; and as for the limitation of "one at a time", this is interpreted to mean one pixel from each vertical transfer path, as taken from applicant's specification on page 11, lines 20-25), and wherein said overflow level setting means controls said substrate bias voltage to a different value according to the value of "n" in the n-addition driving mode by said reading control means (column 9, lines 49-52;

the value is changed based on the value of "n"; e.g. if n is equal to one, the value is different that if n is equal to 2).

6. In regard to claim 5, note Suzuki discloses the use of said overflow level setting means controls said substrate bias voltage based on a relationship between the overflow level of the charge accumulating portion and a saturated level of a horizontal transfer path included in said solid-state imaging element (column 13, line 54 – column 14, line 10; the overflow level is set using the saturation capacity of the photoelectric conversion cells as well as the saturation value of the horizontal transfer part).

7. In regard to claim 6, note Suzuki discloses the use of further comprising said substrate bias voltage in said n-addition driving mode created based on a measured value of the relationship between the overflow level of said charge accumulating portion of said solid-state imaging element and the substrate bias voltage is stored beforehand (column 9, line 61- column 10, line 7; Vsub is created based on the relationship between the overflow level of the charge accumulating portion and the substrate bias voltage; as for the storage of the values, this is not explicitly stated, however, it is inherent, because if the values were not stored, the imaging device would not know what level to adjust the level to), and wherein said overflow level setting means controls said substrate bias voltage in said n-addition driving mode based on the adjustment information in said storage means (column 9, lines 49-52 and column 9, line 61-column10, line 7).

8. In regard to claim 30, note Suzuki discloses said overflow level setting means sets said substrate bias voltage to a first value if the reading control means reads the pixel charges in said normal driving mode and a second value, which is different from the first value, if the reading control means reads the pixel charges in said n-addition driving mode (column 9, line 44- column 10, line 7; the substrate bias voltage is changed when switching between modes).

9. In regard to claim 31, note Suzuki discloses that the first value of the substrate bias voltage is lower than the second value of the substrate bias voltage (column 12, lines 37-60; in normal mode, Vsub is set to level 2, and in n-addition mode, Vsub is set to level 1, which is higher than level 2).

10. In regard to claim 32, note Suzuki discloses that in said normal driving mode, vertical transfer driving is performed once in each horizontal blanking interval (column 2, lines 5-12; and figure 9; vertical transfer of V1 and V3 are driven at separate times between each horizontal blanking period; i.e. one at a time), and wherein, in said n-addition driving mode, vertical transfer driving is performed n-times in each horizontal blanking interval (column 1, lines 56-67; and figure 8; vertical transfer of V1 and V3 are driven between each horizontal blanking period).

11. In regard to claim 33, note Suzuki discloses that each horizontal blanking interval is the same (column 1, lines 56-67; the horizontal blanking interval is performed after each vertical blanking period).

12. In regard to claim 35, note Suzuki discloses that in said normal driving mode, vertical transfer driving is performed once in each horizontal blanking

interval (column 2, lines 5-12; and figure 9; vertical transfer of V1 and V3 are driven at separate times between each horizontal blanking period; i.e. one at a time), and wherein, in said n-addition driving mode, vertical transfer driving is performed n-times in each horizontal blanking interval (column 1, lines 56-67; and figure 8; vertical transfer of V1 and V3 are driven between each horizontal blanking period).

13. In regard to claim 36, note Suzuki discloses that each horizontal blanking interval is the same (column 1, lines 56-67; the horizontal blanking interval is performed after each vertical blanking period).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

14. Claims 11-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Kijima et al. (US Patent # 6,661,451).

15. In regard to claim 11, note Kijima discloses a driving device of a solid-state imaging device (figure 1: 12 and 20; column 2, lines 54-56) comprising a driving unit configured to drive the solid-state imaging device in an addition driving mode in which a plurality of pixels are added and read as a single pixel

(figure 1: 20 and column 3, lines 47-67); and a substrate bias voltage supply configured to apply a bias voltage to a substrate of the solid-state imaging device according to the number of pixels added by said driving unit (column 11, lines 57-67).

16. In regard to claim 12, note Kijima discloses that said driving unit supplies to the solid-state imaging device such a driving pulse as adds a specific number (n: an integer equal to or larger than 2) of pixel charges in a vertical direction of the solid-state imaging device and reads a result of addition (column 3, lines 59-63).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. Claim 34 rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (US Patent # 5,786,852) in view of Kijima et al. (US Patent # 6,661,451).

18. In regard to claim 34, note Suzuki discloses that when "n" is set to a first value, the overflow level setting means sets said substrate bias voltage to a first value, and when "n" is set to a second value, the overflow level setting means sets said substrate bias voltage to a second value (column 12, lines 37-60), and that when the first value of "n" is lower than the second value of "n" and wherein

the first value of the substrate bias voltage is lower than the second value of the substrate bias voltage (column 12, lines 37-60; e.g. if "n" is equal to one, the value of Vsub is lower that if "n" is equal to 2). Therefore, it can be seen that the Suzuki reference fails to disclose the use of an integer greater than 2 for the value of "n". Kijima discloses the use of an integer greater than 2 for the value of "n" (column 10, lines 45-48). Kijima teaches that the use addition of more than two lines is preferred in order to increase the speed of the image readout (column 10, lines 58-61). Therefore, it would have been obvious to one of ordinary skill in the art to modify the Suzuki device to add more than two lines at a time in order to increase the speed of image readout as suggested by Kijima.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will

the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chriss S. Yoder, III whose telephone number is (571) 272-7323. The examiner can normally be reached on M-F: 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ngoc-Yen Vu can be reached on (571) 272-7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

CSY
October 31, 2005

NGOC-YEN VU
PRIMARY EXAMINER